

Amendments to the Claims

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

Claim 1 (Canceled)

Claim 2 (Currently Amended): A ferroelectric capacitor comprising:

a stepped bottom electrode having a planar base electrode with a plurality of projection electrodes on the planar base electrode;

a ferroelectric layer on the stepped bottom electrode; and

a top planar electrode on the ferroelectric layer,

wherein a thickness of the ferroelectric layer on the projection electrodes is less than a thickness of the ferroelectric layer on the planar base electrode, [[and]]

wherein spacing between central portions of each projection electrode has a range from 10% to 20% of a size of the ferroelectric capacitor, and

wherein the top planar electrode comprises a plurality of second projection electrodes thereon, each of the plurality of second projection electrodes facing respective ones of the plurality of projection electrodes.

Claim 3 (Currently Amended): A ferroelectric capacitor comprising:

a stepped bottom electrode having a planar base electrode with a plurality of projection electrodes on the planar base electrode;

a ferroelectric layer on the stepped bottom electrode; and

a top planar electrode on the ferroelectric layer,

wherein a thickness of the ferroelectric layer on the projection electrodes is less than a thickness of the ferroelectric layer on the planar base electrode, [[and]]

wherein a size of each projection electrode has a range from 5% to 10% of a size of the ferroelectric capacitor, and

wherein the top planar electrode comprises a plurality of second projection electrodes thereon, each of the plurality of second projection electrodes facing respective ones of the plurality of projection electrodes.

Claim 4 (Canceled)

Claim 5 (Withdrawn): The ferroelectric capacitor of claim 2, wherein the projection electrodes are bismuth or bismuth alloy.

Claim 6 (Withdrawn): The ferroelectric capacitor of claim 5, wherein the planar base electrode is a metal which includes bismuth.

Claim 7 (Currently Amended): A ferroelectric capacitor comprising:

a stepped bottom electrode having a planar base electrode with a plurality of projection electrodes on the planar base electrode;

a ferroelectric layer on the stepped bottom electrode; and

a top planar electrode on the ferroelectric layer,

wherein the projection electrodes are arranged spaced apart from each other evenly, [[and]]

wherein a thickness of the ferroelectric layer on the projection electrodes is less than a thickness of the ferroelectric layer on the planar base electrode, and cores of polarization inversion within the ferroelectric layer extend from the projection electrodes,
and

wherein the top planar electrode comprises a plurality of second projection electrodes thereon, each of the plurality of second projection electrodes facing respective ones of the plurality of projection electrodes.

Claim 8 (Previously Presented): The ferroelectric capacitor of claim 2, wherein the planar base electrode and the projection electrodes are a same material.

Claims 9 – 14 (Canceled)

Claim 15 (Currently Amended): A ferroelectric capacitor comprising:

a first stepped electrode comprising a first planar electrode having a plurality of projection electrodes on the first planar electrode and spaced apart from each other evenly;

a second planar electrode; and

a ferroelectric layer sandwiched between the first stepped electrode and the second planar electrode,

wherein a thickness of the ferroelectric layer on the projection electrodes is less than a thickness of the ferroelectric layer on the ~~second~~ first planar electrode, and cores of polarization inversion within the ferroelectric layer extend from the [[third]] projection electrodes, and

wherein the second planar electrode comprises a plurality of additional electrodes thereon, each of the additional electrodes facing respective ones of the projection electrodes.

Claims 16-17 (Canceled)

Claim 18 (Previously Presented): The ferroelectric capacitor of claim 15, wherein the first planar electrode and the projection electrodes are a same material.

Claims 19-20 (Canceled)

Claim 21 (Withdrawn): The ferroelectric capacitor of claim 3, wherein the projection electrodes are bismuth or bismuth alloy.

Claim 22 (Withdrawn): The ferroelectric capacitor of claim 21, wherein the planar base electrode is a metal which includes bismuth.

Claim 23 (Withdrawn): The ferroelectric capacitor of claim 3, wherein the planar base electrode and the projection electrodes are a same material.

Claim 24 (Canceled)

Claim 25 (Withdrawn): The ferroelectric capacitor of claim 7, wherein the projection electrodes are bismuth or bismuth alloy.

Claim 26 (Withdrawn): The ferroelectric capacitor of claim 25, wherein the planar base electrode is a metal which includes bismuth.

Claim 27 (Withdrawn): The ferroelectric capacitor of claim 7, wherein the planar base electrode and the projection electrodes are a same material.